



SUSTAINING SAFE NUCLEAR OPERATIONS IN AN INFLUENZA PANDEMIC

**Summary of NRC Pandemic Flu Workshop
Held on April 27, 2006**

**Office of Nuclear Security and Incident Response
U. S. Nuclear Regulatory Commission**

ABSTRACT

On April 27, The NRC held a workshop on how to operate nuclear facilities safely during an influenza pandemic. The objectives of the workshop were: (1) to determine the issues affecting electricity production and security that NRC and facility operators can anticipate from a rapidly spreading pandemic, and (2) to determine what actions the NRC might need to take on an emergency basis to assure that safety, security, emergency response capability, and reliable electric production are all maintained. Panels of experts from NRC, other Federal agencies, state agencies, and the utility industry discussed how they would cope with various situations described in a severe flu pandemic scenario. The overall outcome of the workshop is that utility representatives expressed confidence that they could operate their plants safely and reliably even with the high absenteeism rates that might occur during a severe flu pandemic. However, to accomplish that, they might require rapid NRC action to grant regulatory relief in some areas during the flu pandemic. This summary of the issues discussed at the workshop was provided to the NRC task force developing a plan for the NRC's response to a flu pandemic.

SUMMARY

Panel 1 addressed early steps taken to respond to the arrival of the pandemic. Preventing the spread of the flu virus is complicated by the fact that the virus can be spread by people who are infected but have no symptoms during the first 24 to 48 hours.

The questions that **Panel 1** addressed were: What steps should be taken early in a flu pandemic to minimize disruption? Is sequestering workers a practical or workable approach? For how long would sequestering be necessary? Use of masks and other protective equipment? Use of work station disinfectant and cleaning? Use of telecommuting for critical workers who do not need to be on-site? Should NRC resident inspectors also be sequestered?

Sequestering of nuclear power plant workers was seen as a favored option by some of the utilities at the start of the workshop. The panel discussion revealed numerous logistical problems, however. For instance, for sequestering to be effective, the NRC resident staff would also have to sequester with the plant staff. NRC inspectors from outside the facility would have to undergo a quarantine period before entering the facility.

By the end of the workshop, the sequestering option seemed less necessary and less desirable because of the difficulties of long-term sequestering and because it seemed that such drastic measures would not be required to operate effectively. All in all, the picture presented was that the spread of the flu virus should be reduced to manageable levels by targeted hygiene practices such as cough etiquette, hand-washing, surgical mask use, and others.

The fatality rate and transmissibility seemed likely to be less than feared. An HHS/CDC panelist stated that fatality rates from avian flu are expected to drop markedly as the flu develops the ability to pass from human to human. Fatality rates among those infected are expected to be between 0.2 to 2%, far less than the 50% fatality rate for the currently-existing poorly-transmissible avian flu strain. However, since a strain readily transmissible from human to human does not now exist, there is uncertainty about how lethal it would be.

To slow the spread of the flu, it is important to make sure that people who are feeling sick do not come to work and spread the flu to others. Also, anyone who feels sick should immediately go home. Public education on this and on basic hygiene is very important. The HHS/CDC panelist also said that surgical masks are very effective in stopping the spread of the virus. Transmission of the virus is primarily by droplets from sneezing that are inhaled or deposited on surfaces. The virus is then, in turn, picked up on hands by touching the surface. From the hands, the virus enters people due to hand contact with mouth, eyes, or nose. Application of alcohol to a surface will kill the virus. Unlike SARS, flu viruses are not as dependent on inhalation as a source of infection.

Panel 2 addressed the use of vaccines and antiviral medicines. The question they addressed was: If vaccines and antiviral medicines were available in only very limited supplies, who would need to receive them to assure the continued safe operation of the facility?

Utility representatives were preparing lists of priority positions. Panelists thought that, from a risk perspective, absenteeism among emergency diesel generator and switchyard personnel might present the greatest risk to safety. However, the panelists said that workers maintaining the electric generating capacity do not have a high priority for receiving flu vaccines and anti-viral medicines. They believed the priority for the nuclear power sector should be increased. It was pointed out that the President has power to reassign priorities as needed at the time.

It was stated that antiviral medicine (like tamiflu) can be used as a prophylactic if workers may have been inadvertently exposed to the flu virus. Stockpiles can be purchased in

advance. However, the effectiveness of anti-viral medicines against a virus strain that does not yet exist cannot be tested or known with certainty.

Panel 3 addressed the issue of dealing with high rates of absenteeism (up to 40%) at a time when the electricity supply might be so stressed as to cause grid instability due to the loss of production from non-nuclear power generating facilities. The panel addressed these questions: If plants encountered absenteeism rates of 40% with even higher rates among some worker groups, what relief would they need in terms of operations staffing and work hour restrictions to maintain the safe operation of the facility? (Required numbers of senior reactor operators? Diminished emergency response capabilities? Reduced maintenance and surveillance activities? Exceeding normal work hour limits? Rapidly re-licensing individuals who had been reactor operators?)

The PJM Grid Operators said that grid instability as described in the scenario was not realistic. They said that loss of electric generation capacity would not cause grid instability as suggested in the scenario because they knew how to shed load if capacity was not adequate. Thus, the loss of generating capacity could cause rolling blackouts, but would not cause grid collapse.

Utility representatives said that they were well-prepared to cope with high rates of absenteeism. They said that strike plans and adverse weather plans could serve as a model for flu plans. They said it was important that plans for dealing with the flu be prepared.

However, they said that a lack of manpower due to high rates of absenteeism might, in some instances, create a need to defer non-essential maintenance and surveillance activities. They said that Technical Specifications allow for some gaps in personnel coverage. However, they said that some reductions in staffing or maintenance might require permission from the NRC with a very short time for evaluation and approval. They said that licensees have a hard time planning if they do not know the amount of maintenance and surveillance activities that might be acceptable to NRC.

The utility representatives said that NRC needs to be prepared to rapidly process unusually large numbers of requests for Notice of Enforcement Discretion (NOEDs) on an emergency basis.

Utility representatives said that if some activities are put on hold (holding exercises, maintenance, surveillance) it will be extremely difficult to clear the backlog after the flu pandemic emergency has passed.

Panel 4 addressed the issue of how NRC would deal with a large number of requests from nuclear plant operators for regulatory relief from certain regulatory requirements because of high rates of absenteeism. The panel addressed the following questions: How would NRC maintain the capability to: Respond to an emergency? Conduct inspections? Respond to requests for regulatory relief? How could NOEDs be issued? Could blanket NOEDs be issued?

Can the NRC be assured of safety with significantly reduced plant inspections? How would it be explained to the public?

Panelists said that the NRC should be prepared to evaluate NOED requests, license amendment requests, and 50.54(x) actions. To issue NOEDs, the NRC would have to develop a general strategy to preplan and pre-stage, make decisions in advance, and maintain flexibility while ensuring safety. The NOED process would have to be streamlined to deal with large numbers of requests that could be submitted on an emergency basis.

A focus should be on a strategy to preplan or pre-stage decisions in advance in a way that maintains safety. An expedited NOED process is needed that addresses societal risks of shutting down nuclear plants.

The NRC must be prepared to explain to the public that any reduced maintenance and surveillance activities will not cause significant risks to the public over the limited period they are in effect.

Panel 5 dealt specifically with the issue of high absenteeism among the plant security staff at a time when the local law enforcement and National Guard could not give assistance because of other priorities. The panel addressed these questions: Would high absenteeism make it not possible to maintain required security staffing levels? What relief might be requested? What contingency measures are available?

Panelists pointed out that minimum required staffing is identified in licensing documents, but that regulatory relief applies here just as with operations. However, if minimum security resources are not available, the plant would be shut down. For this situation, the bounds of 50.54(x) and 50.54(y) could be investigated. Licensees could propose effective security strategies with minimum staffing and could reduce or eliminate extra duties for security officers.

Panel 6 addressed the issue of high absenteeism among state and local emergency responders assuming that the ranks of emergency responders were so depleted by illness, that they no longer had sufficient staffing to carry out their emergency plans. The panel addressed the questions: How would a high absenteeism rate among State and local emergency responders impact their capability to respond to an emergency? How would NRC/FEMA view this from a regulatory perspective? What should be done?

States said that they had plans for dealing with situations such as these and that they had mutual aid agreements with neighboring states. Effective mutual aid requires that “social capital” and person-to-person relationships be built in advance. DHS said that they would look not only at staffing levels, but at the skill set of the staff that is affected. FEMA would balance risk of plant shutdown against risk of degraded response capability in making its decision.

As an emergency response recommendation for the public in the event of a nuclear power plant emergency, sheltering might be preferred over evacuation because evacuation would incur additional risks due to increased transmission of the flu in evacuation shelters.

UNRESOLVED ISSUES

There are two important unresolved issues from the workshop. First, the desirability and feasibility of using sequestering as a strategy to prevent high rates of absenteeism from the flu was not clearly established. The sequestering strategy needs more study.

Second, it is not clear how the NRC would be able to process numerous requests for NOEDs quickly enough to avoid rolling blackouts. NRC needs to review its NOED process so that NOED requests can be quickly processed and a decision that does not cause undue risk can be made.